

I CLAIM:

1. A locking pin assembly comprising:
a button movable in a first direction from a first position to a second position;
5 a first biasing member for biasing the button to be normally in the first position;
a locking pin member engaging the button and movable in a second direction, which is substantially perpendicular to the first direction, from a third position to a fourth position
10 when the button is moved from the first position to the second position; and
a second biasing member for biasing the locking pin member to be normally in the third position.

15 2. The locking pin assembly of claim 1, wherein the locking pin assembly further comprises a housing for holding the first biasing member, the second biasing member, at least a portion of the button, and at least a portion of the locking pin member.

20 3. The locking pin assembly of claim 2, further comprising a cover for the housing, said cover comprising a support member for providing a structural support to the second biasing member.

25 4. The locking pin assembly of claim 2, wherein the button comprises:

a pressing member having a first end and a second end, the first end protruding out of the housing through a first
30 opening on the housing when the button is in the first position;

an engagement member having a first end and a second end, said first end having a tapered tip for engaging the locking pin member; and

5 a connecting portion disposed between the pressing member and the engagement member, said connecting portion forming a flange between the pressing member and the engagement member,

wherein a radius of the flange is larger than that of the first opening such that the flange prevents the engagement
10 member from exiting the housing when the first biasing member biases the button towards the first position.

5. The locking pin assembly of claim 4, wherein the locking pin member comprises:

15 a locking pin having a first end and a second end, the first end protruding out of the housing through a second opening on the housing when the locking pin member is in the third position;

an inclined portion that engages the tapered tip of
20 the engagement member; and

a disk shaped connecting portion disposed between the locking pin and the inclined portion,

wherein a radius of the disk shaped connecting portion is larger than that of the second opening such that the flange
25 prevents the inclined portion from exiting the housing when the second biasing member biases the locking pin member towards the third position.

6. The locking pin assembly of claim 5, wherein as the
30 pressing member of the button is pressed, the button moves in the first direction towards the second position, and the tapered tip of the engagement member slides with respect to the inclined

portion of the locking pin member such that the locking pin member is moved in the second direction towards the fourth position.

5 7. The locking pin assembly of claim 1, wherein at least one of the first biasing member and the second biasing member is a spring.

10 8. In a collapsible canopy comprising a plurality of telescoping side poles, each having upper and lower telescoping sections, and a plurality of edge scissor assemblies that interconnect the side poles, a height adjustment bracket for fixing the upper and lower telescoping sections together, comprising:

15 a fixing section for engaging a corresponding said upper telescoping section; and

 a locking pin assembly attached to the fixing section, comprising:

20 a button movable in a first direction from a first position to a second position;

 a first biasing member for biasing the button to be normally in the first position;

25 a locking pin member engaging the button and movable in a second direction, which is substantially perpendicular to the first direction, from a third position for fixing corresponding said upper and lower telescoping sections together to a fourth position for disengaging the lower telescoping section from the upper telescoping section when the button is moved from the first position to the second position;

30 and

 a second biasing member for biasing the locking pin member to be normally in the third position.

9. The height adjustment bracket of claim 8, wherein the locking pin assembly further comprises a housing for holding the first biasing member, the second biasing member, at least a portion of the button, and at least a portion of the locking pin member.

10. The height adjustment bracket of claim 9, further comprising a cover for the housing, said cover comprising a support member for providing a structural support to the second biasing member.

11. The height adjustment bracket of claim 9, wherein the button comprises:

15 a pressing member having a first end and a second end, the first end protruding out of the housing through a first opening on the housing when the button is in the first position;

an engagement member having a first end and a second end, said first end having a tapered tip for engaging the locking pin member; and

20 a connecting portion disposed between the pressing member and the engagement member, said connecting portion forming a flange between the pressing member and the engagement member,

25 wherein a radius of the flange is larger than that of the first opening such that the flange prevents the engagement member from exiting the housing when the first biasing member biases the button towards the first position.

30 12. The height adjustment bracket of claim 11, wherein the locking pin member comprises:

a locking pin having a first end and a second end, the first end protruding out of the housing through a second opening on the housing when the locking pin member is in the third position;

5 an inclined portion that engages the tapered tip of the engagement member; and

a disk shaped connecting portion disposed between the locking pin and the inclined portion,

10 wherein a radius of the disk shaped connecting portion is larger than that of the second opening such that the flange prevents the inclined portion from exiting the housing when the second biasing member biases the locking pin member towards the third position.

15 13. The height adjustment bracket of claim 12, wherein as the pressing member of the button is pressed, the button moves in the first direction towards the second position, and the tapered tip of the engagement member slides with respect to the inclined portion of the locking pin member such that the locking
20 pin member is moved in the second direction towards the fourth position.

14. The height adjustment bracket of claim 8, wherein the fixing section includes at least one resilient member and a stub
25 formed thereon, wherein the stub is used to engage a hole on the upper telescoping section so as to fix the height adjustment bracket to the upper telescoping section.

15. In a collapsible canopy comprising a plurality of side
30 poles, and a plurality of edge scissor assemblies that interconnect the side poles, a sliding mounting bracket for

coupling the edge scissor assemblies to the side poles, comprising:

a sliding section for slidably engaging a corresponding said side pole; and

5 a locking pin assembly attached to the sliding section, comprising:

a button movable in a first direction from a first position to a second position;

10 a first biasing member for biasing the button to be normally in the first position;

a locking pin member engaging the button and movable in a second direction, which is substantially perpendicular to the first direction, from a third position for fixing the sliding mounting bracket to the side pole to a fourth
15 position for disengaging the sliding mounting bracket from the side pole when the button is moved from the first position to the second position; and

a second biasing member for biasing the locking pin member to be normally in the third position.

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16. The sliding mounting bracket of claim 15, wherein the locking pin assembly further comprises a housing for holding the first biasing member, the second biasing member, at least a portion of the button, and at least a portion of the locking pin
25 member.

17. The locking pin assembly of claim 16, further comprising a cover for the housing, said cover comprising a support member for providing a structural support to the second
30 biasing member.

18. The sliding mounting bracket of claim 16, wherein the button comprises:

a pressing member having a first end and a second end, the first end protruding out of the housing through a first opening on the housing when the button is in the first position;

an engagement member having a first end and a second end, said first end having a tapered tip for engaging the locking pin member; and

a connecting portion disposed between the pressing member and the engagement member, said connecting portion forming a flange between the pressing member and the engagement member,

wherein a radius of the flange is larger than that of the first opening such that the flange prevents the engagement member from exiting the housing when the first biasing member biases the button towards the first position.

19. The sliding mounting bracket of claim 18, wherein the locking pin member comprises:

a locking pin having a first end and a second end, the first end protruding out of the housing through a second opening on the housing when the locking pin member is in the third position;

an inclined portion that engages the tapered tip of the engagement member; and

a disk shaped connecting portion disposed between the locking pin and the inclined portion,

wherein a radius of the disk-shaped connecting portion is larger than that of the second opening such that the flange prevents the inclined portion from exiting the housing when the second biasing member biases the locking pin member towards the third position.

20. The sliding mounting bracket of claim 19, wherein as the pressing member of the button is pressed, the button moves in the first direction towards the second position, and the tapered tip of the engagement member slides with respect to the inclined portion of the locking pin member such that the locking pin member is moved in the second direction towards the fourth position.

- 10 21. A collapsible canopy frame comprising:
- a plurality of telescoping side poles, each telescoping side pole having an upper section and a lower section;
 - a height adjustment bracket mounted on each
 - 15 telescoping side pole, comprising:
 - a fixing section for engaging the upper section;
 - and
 - a first locking pin assembly connected to the fixing section, comprising:
 - 20 a first button movable in a first direction from a first position to a second position;
 - a first biasing member for biasing the button to be normally in the first position;
 - a first locking pin member engaging the
 - 25 first button and movable in a second direction, which is substantially perpendicular to the first direction, from a third position for fixing the upper and lower sections together to a fourth position for disengaging the lower section from the upper section when the first button is moved from the first position
 - 30 to the second position; and
 - a second biasing member for biasing the first locking pin member to be normally in the third position;

a set of edge scissor assemblies that are pivotably coupled between each of pairs of the side poles, each of said edge scissor assemblies having relatively rotatable ribs;

5 a stationary mounting bracket fixedly mounted at top of each telescoping side pole, said stationary mounting bracket being pivotably coupled with upper outer ends of two respective edge scissor assemblies; and

10 a sliding mounting bracket slidably mounted between the stationary mounting bracket and the height adjustment bracket on each of the telescoping side poles, said sliding mounting bracket being pivotably coupled with lower outer ends of two respective edge scissor assemblies.

22. The collapsible canopy frame of claim 21, wherein the
15 sliding mounting bracket comprises:

a sliding section for slidably engaging the upper section of the telescoping side pole; and

a second locking pin assembly connected to the sliding section, comprising:

20 a second button movable in a third direction from a fifth position to a sixth position;

a third biasing member for biasing the second button to be normally in the fifth position;

25 a second locking pin member engaging the second button and movable in a fourth direction, which is substantially perpendicular to the third direction, from a seventh position for fixing the sliding mounting bracket to the upper section of the side pole to an eighth position for disengaging the sliding mounting bracket from the upper section of the side pole when
30 the second button is moved from the fifth position to the sixth position; and

a fourth biasing member for biasing the second locking pin member to be normally in the seventh position.

23. The collapsible canopy frame of claim 21, wherein each lower section has a plurality of vertically apart holes formed thereon, such that the height of each side pole can be adjusted by engaging different ones of the holes with the first locking pin member

24. The collapsible canopy frame of claim 21, further comprising:

a center support pole; and

a plurality of center scissor assemblies, each scissor assembly being pivotably coupled between the center support pole and a corresponding said set of the edge scissor assemblies.

25. A collapsible canopy frame comprising:

a plurality of side poles;

a set of edge scissor assemblies that are pivotably coupled between each of pairs of the side poles, each of said edge scissor assemblies having relatively rotatable ribs;

a stationary mounting bracket fixedly mounted at top of each side pole, said stationary mounting bracket being pivotably coupled with upper outer ends of two respective edge scissor assemblies; and

a sliding mounting bracket slidably mounted below the stationary mounting bracket on each of the side poles, said sliding mounting bracket being pivotably coupled with lower outer ends of two respective edge scissor assemblies, the sliding mounting bracket comprising:

means for slidably engaging the side pole; and

a locking pin assembly connected to the slidably engaging means, comprising:

a first button movable in a first direction from a first position to a second position;

5 first biasing means for biasing the first button to be normally in the first position;

a first locking pin member engaging the first button and movable in a second direction, which is substantially perpendicular to the first direction, from a third position for
10 fixing the sliding mounting bracket to the side pole to a fourth position for disengaging the sliding mounting bracket from the side pole when the first button is moved from the first position to the second position; and

second biasing means for biasing the first
15 locking pin member to be normally in the third position.

26. The collapsible canopy frame of claim 25, wherein each of the side poles is a telescoping side pole having an upper section and a lower section, further comprising:

20 a height adjustment bracket mounted on each telescoping side pole, comprising:

a fixing section for engaging the upper section;
and

a second locking pin assembly connected to the
25 fixing section, comprising:

a second button movable in a third direction from a fifth position to a sixth position;

third biasing means for biasing the second button to be normally in the fifth position;

30 a second locking pin member engaging the second button and movable in a fourth direction, which is substantially perpendicular to the third direction, from a

50861/JEJ/C1015

seventh position for fixing the upper and lower sections together to an eighth position for disengaging the lower section from the upper section when the second button is moved from the third position to the fourth position; and

- 5 fourth biasing means for biasing the second locking pin member to be normally in the seventh position;